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Recycling Research

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I sometimes think that we should make a bigger deal out of research that doesn't work, or at least does not work as expected. I'm not referring to the spectacular finds. Mistakes that lead to landmark discoveries such as the invention of Teflon get plenty of press. Nor am I referring to research that is badly executed. I'm alluding to ideas that seemed good at the time of creation, but result as research questions asked too soon, or better approached using a different method. Such projects, occasionally published, are ignored by educators seeking models of "good" research for their students. As an educator, I argue for more constructive use of the ideas that do not "pan out." I know that my own project disappointments are often as instructive as my successes. Certainly in terms of process, they have taught me more. These "failed" projects increase my pool of questions and affect the way I approach every subsequent project. Therefore, they can become an ideal learning experience, especially when personal mishaps are shared with students.

To illustrate, let me describe, briefly, one such project. The idea germinated from my days as a practicing librarian when I noticed that, in planning for new electronic technologies, librarians tended to focus on the new services to be provided, the training of staff and patron users, the issues of redesigning workflow, and always, ways to shorten the timeline. Since the operating budget was never proportionally increased with the costs of the new services, it seemed odd that the necessity of, and therefore, the choices in, diverting monies from services that had been previously provided were seldom discussed explicitly. The pattern was to adopt new technologies and to deal with the fallout as opportunities and problems arose. The elimination of services was not as carefully choreographed as the plans for new services that automation made possible. This observation led to an interest in the longterm effects of automation in libraries.

Methodology

I reasoned that one way to approach the issue would be to study library budgets over time to determine if budgets reflected different patterns of expenditure depending upon whether the libraries were automated. The resulting study, conducted as a student project nearly ten years ago, was a trend analysis of six years of data from public libraries in Illinois. The data used were expenditures from the Illinois Public Library Annual Report form (IPLAR) for the fiscal years 1983-88. The IPLAR is a required report for all public libraries in Illinois. The data were available from the Library Research Center (LRC) of the Graduate School of Library and Information Science at the University of Illinois (Urbana-Champaign). Even though the statewide automation efforts of Illinois began, at least conceptually, in 1974, at the time of the study these six years represented the most active period of local system automation.

The IPLAR form defines seven categories of expenditures: (1) salaries and wages for staff (other than building maintenance staff) including fringe benefits; (2) salaries and wages for building maintenance staff, including fringe benefits; (3) printed materials, including books, periodicals, microforms, pamphlets, government documents, etc.; (4) nonprint materials, including all materials used by visual projection and/or sound reproduction (e.g., films, phonorecords, tape cassettes, film-strips, slides), framed pictures, sculpture, etc.; (5) all other operating expenditures not listed above, including expenditures for library and general office supplies, processing costs, commercial binding and rebinding, equipment, rent, utilities, repairs, etc. (purchase of fixed assets was included under "capital outlay for all other fixed assets"); (6) capital outlay for building construction, including amounts expended during the fiscal year on construction of a new building, or an addition to, or remodeling of, an existing building, that cost at least $1,000; (7) capital outlay for all other fixed assets, including expenditures for land and improvements to land, for the purchase of existing buildings, for long-term debt retirement (e.g., mortgage payments), for equipment costing more than $1,000, etc.). Fixed assets are those items that are not consumed in use, can be expected to last at least five years, and cost at least $1,000.

The definitions for the categories, first written in 1961, were not written considering automation. They are imprecise and it is possible that automation costs are distributed over several categories. Automation can cause a change in staff size resulting in a subsequent change in the proportion of the total budget spent for salaries. Software can be included with nonprint materials even though the description implies circulating materials. Automation equipment costing more than $1,000 could fall into the category of capital outlay for fixed assets. Software program updates and telecommunication costs may likely fall into the category of "other operating expenditures" that is defined to include expenditures for library and office supplies and utilities. Another expenditure that may be included in "other" is equipment maintenance.

During the routine analysis of the 1987-88 IPLAR data, the LRC staff called a handful of libraries to determine why the proportion of "other" to total expenditures had increased significantly in fiscal year 1988. The libraries indicated that the increase was due to the cost of automation, and that they were using "other" to record the ongoing costs of software and telecommunication. Based upon the recording of automation expenses in this way, and upon the confirming conversations, it was decided to use the category "other operating expenditures" as the benchmark for long-term automation costs. The other six categories of expenditures were examined after the results from the analysis of "other" were obtained.

In addition to the expenditure variables, data were also used from a 1987-88 IPLAR special question related to automation. This question asked respondents to indicate which, if any, of several library functions were automated in their library. Libraries that responded to the question were divided into groups depending upon automated access to other libraries, cataloging, or reference use of databases—or any combination of the three. Comparisons were made for the 1983-88 fiscal years and for the 1985-88 fiscal years.

The six-year span represents all the data available for the study. Analyses of the 1985-88 fiscal years were performed as a comparison because library literature indicated that 1985 was a pivotal year for library finances. The court-ordered divestiture of American Telephone and Telegraph took place January 1, 1984, and by fiscal year 1985 libraries were feeling the effects of the deregulation with costs of telecommunications increasing as much as 80 percent. It was also at this time that state and federal monies became more difficult to obtain.

Results

For the sake of brevity, only the results of testing two of the four hypotheses are summarized. The hypotheses:

- *Hypothesis 1.* The proportion of monies spent for "other operating expenditures" will increase at a different rate for libraries that have automated than for libraries that have not automated.
- *Hypothesis 2.* Libraries that have automated will spend a different proportion of their budgets on "other operating expenditures" than libraries that have not automated.

There were no significant differences between automated and nonauto-mated libraries in terms of the amount of increase in the proportion of monies spent for "other library expenditures" between fiscal years 1983 and 1988. There were, however, significant differences in the amount of increase for the automation groups from fiscal years 1985 to 1988. This latter result appeared to support the observation that the time around 1985 was critical for Illinois public library finances.

In comparing just those libraries that had automated (that is, automated access, cataloging, and reference) with those that had not automated, it was discovered that there was a difference between the two groups, and that the difference was due to a decrease in the proportion of monies spent for "other library expenditures" by libraries without automation. Automated libraries showed no significant increase or decrease in the proportion for the category of "other" from fiscal year 1985 to fiscal year 1988.

There was no difference (fiscal years 1985-88) in the amount of increase between libraries that had automated only one function and libraries that had automated more than one. This might indicate that ongoing expenses for automation did not increase proportionally as the number of functions increased. This result makes sense intuitively. The impact on the budget, even for ongoing expenditures, may be greatest with the first function automated.

It was also predicted that libraries that were automated would spend a different proportion of their total expenditures on "other" than libraries without automation. Based upon comparisons of expenditures for fiscal years 1983, 1985, and 1988, the prediction was correct. However, the direction of the difference was a surprise. Libraries that are automated spent a *smaller* proportion of their budgets on the category of "other" than libraries that were not automated. The automated libraries spent a greater proportion on capital expenditures. Capital outlay includes computer equipment costs and costs for building renovation associated with automation. Therefore, in retrospect, it is not surprising that automated libraries spent more in this category than non auto-mated libraries. However, there remains no way of knowing if automation was, in fact, the cause.

Examination of the percent of the total budgets spent on "other" by libraries that had automated versus those that had not provides insight into why there were no significant differences in the *amount of increase* of "other" as predicted by hypothesis 1. Plotting the percent of total "other" expenditures for the two groups for each of the three fiscal years under discussion reveals that the changes between fiscal years 1983 and 1985 were "canceled out" by the changes between fiscal years 1985 and 1988.

Discussion

The results of this project reveal very little about how expenditures for automation in the early stages of Illinois public library automation affected expenditures for other services. Realizing that many of the early equipment costs of automation were funded by grants, it was hoped that, by studying budget data over time, it would be possible to gain some understanding about automation funding trends. However, the project did not conclude as expected, primarily because the data used were not sufficient to answer the questions posed. One of the problems of using data collected by other researchers is that the answers often do not match your questions; that is, their data collection methods were not designed to answer the questions of your research. It is always difficult to answer "why" questions in a project and it is especially difficult in secondary analysis. Yet exploration of trends requires using data that have been collected consistently, year after year. It is not always possible to gather data anew.

Well into the project it became apparent that the data were not going to reveal the results desired. Ideally, alternative data-gathering methods would have been attempted, such as selective phone surveys to see if another aspect of the question might place the IPLAR data in a better framework. Based upon these attempts, it appears that the cost of library automation is simply too complex a phenomenon to be captured by these data. Given the fact that the study was performed in an academic environment within the constraints of a semester, it was not possible to change direction and explore alternate methodologies.

I still believe the question is important; however, I still am unable to ask it in such a way that leads to an understanding of what I desire to know, given the constraints of existing data. Was the project worth the struggle? It certainly does not represent sterling research, but the project did teach me about process, about flawed assumptions, and especially about the research question. It has also provided me with a teaching tool.

Teaching

How is this experience a teaching tool? At Kent State, library and information science students are required to complete a master's research paper in which they explore a research idea, evaluate a model, or create an original project. Each student works individually with a faculty advisor. Ideally the project can be completed within one academic semester. I have used the project described here in a number of ways. At the simplest level, it is a good illustration that perfection is not a requirement for the degree!...and that in research we cannot control outcomes. I find that sometimes sharing a "failure" with a student does much to diminish the fear of the "dreaded first research project."

More important, the project has been used to illustrate that the lack of results can often inform us about the nature of the questions asked. This project has served as an excellent spring-board for a discussion of methods, data reliability, data standardization, and data analysis. It is easy for students to see the flaws and they are frequently eager to "fix the problems." Obvious problems can provide a nurturing environment for all students, even the inexperienced, to brainstorm additional ways to approach a research question.

I consider it important that we help our students develop an enthusiasm for research. My hopes for students are that they will always have more questions than answers, and that their

learning will continuously affect their work. One of the ways to get students excited is to get them involved in the process and to give them opportunities to develop self-confidence in their skills. Recycling through our own mistakes can help accomplish this.